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USPT	OKT3.clm.	20	<u>L3</u>
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USPT	5852177.pn.	1	<u>L1</u>

(FILE 'HOME' ENTERED AT 08:18:23 ON 02 MAY 2001)

FILE 'MEDLINE' ENTERED AT 08:18:40 ON 02 MAY 2001

L1 2923 S OKT3  
L2 187545 S CYSTEINE OR STABIL?  
L3 26 S L1 AND L2

=> s little m/au  
L4 176 LITTLE M/AU

=> s l4 and l1  
L5 2 L4 AND L1

L3 ANSWER 5 OF 26 MEDLINE  
 ACCESSION NUMBER: 97337430 MEDLINE  
 DOCUMENT NUMBER: 97337430 PubMed ID: 9194170  
 TITLE: Two amino acid mutations in an anti-human CD3 single chain  
 Fv antibody fragment that affect the yield on bacterial  
 secretion but not the affinity.  
 AUTHOR: Kipriyanov S M; Moldenhauer G; Martin A C; Kupriyanova O  
 A;  
 Little M  
 CORPORATE SOURCE: Department of Molecular Immunology, German Cancer Research  
 Center (DKFZ), Heidelberg, Germany.  
 SOURCE: PROTEIN ENGINEERING, (1997 Apr) 10 (4) 445-53.  
 Journal code: PRL; 8801484. ISSN: 0269-2139.  
 PUB. COUNTRY: ENGLAND: United Kingdom  
 Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 199708  
 ENTRY DATE: Entered STN: 19970902  
 Last Updated on STN: 19970902  
 Entered Medline: 19970818

AB Recombinant antibody fragments directed against cell surface antigens  
 have

facilitated the development of novel therapeutic agents. As a first step  
 in the creation of cytotoxic immunoconjugates, we constructed a  
 single-chain Fv fragment derived from the murine hybridoma **OKT3**,  
 that recognizes an epitope on the epsilon-subunit of the human CD3  
 complex. Two amino acid residues were identified that are critical for

the

high level production of this scFv in Escherichia coli. First, the  
 substitution of glutamic acid encoded by a PCR primer at position 6 of VH  
 framework 1 by glutamine led to a more than a 30-fold increase in the  
 production of soluble scFv. Second, the substitution of **cysteine**  
 by a serine in the middle of CDR-H3 additionally doubled the yield of  
 soluble antibody fragment without any adverse effect on its affinity for  
 the CD3 antigen. The double mutant scFv (Q,S) proved to be very stable in  
 vitro: no loss of activity was observed after storage for 1 month at 4  
 degrees C, while the activity of scFv containing a **cysteine**  
 residue in CDR-H3 decreased by more than half. The results of production  
 yield, affinity, **stability** measurements and analysis of  
 three-dimensional models of the structure suggest that the sixth amino  
 acid influences the correct folding of the VH domain, presumably by  
 affecting a folding intermediate, but has no effect on antigen binding.

L3 ANSWER 1 OF 26 MEDLINE  
 ACCESSION NUMBER: 2001178458 MEDLINE  
 DOCUMENT NUMBER: 21099443 PubMed ID: 11169443  
 TITLE: Recombinant chimeric **OKT3** scFv IgM antibodies  
 mediate immune suppression while reducing T cell  
 activation in vitro.  
 AUTHOR: Choi I; De Ines C; Kurschner T; Cochlovius B; Sorensen V;  
 Olafsen T; Sandlie I; Little M  
 CORPORATE SOURCE: Recombinant Antibody Research Group (D0500), German Cancer  
 Research Center, Heidelberg, Germany.  
 SOURCE: EUROPEAN JOURNAL OF IMMUNOLOGY, (2001 Jan) 31 (1) 94-106.  
 Journal code: EN5; 1273201. ISSN: 0014-2980.  
 PUB. COUNTRY: Germany: Germany, Federal Republic of  
 Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 200103  
 ENTRY DATE: Entered STN: 20010404  
 Last Updated on STN: 20010404  
 Entered PubMed: 20010222  
 Entered Medline: 20010329

AB **OKT3**, a mouse anti-human CD3 monoclonal antibody (mAb), is a  
 potent immunosuppressive agent used in clinical transplantation to treat  
 allograft rejection. Two major drawbacks of this therapy are the systemic  
 release of several cytokines due to cross-linking mediated by the mAb  
 between T cells and FcγR-bearing cells and the human anti-mouse  
 antibody (HAMA) response. To overcome these side effects, three chimeric  
**OKT3** single chain variable fragment (scFv) IgM antibodies,  
 scOKT3-γ DeltaIgM wt, scOKT3-γ DeltaIgM C575S and scOKT3-γ  
 DeltaIgM VAEVD, were generated. They consist of the light and heavy  
 variable binding domains of **OKT3** mAb as well as the CH3 and CH4  
 domains of different human IgM variants linked with a human IgG3 hinge  
 region to provide more flexibility and **stability**. Like the  
 native IgM, scOKT3-γ DeltaIgM antibodies are able to form polymeric  
 structures, which lead to an increase in binding affinity and  
 immunosuppressive potential compared with the parental **OKT3** mAb.  
 However, independently of their polymerization, all scOKT3-γ DeltaIgM  
 constructs do not induce any significant T cell proliferation or cytokine  
 release (IL-2, TNF-α and IFN-γ) in in vitro assays, while their  
 CD3-modulating properties are retained. These results suggest that the  
 use of scOKT3-γ DeltaIgM antibodies may offer significant advantages over  
 the **OKT3** mAb in improving clinical immunosuppressive treatment



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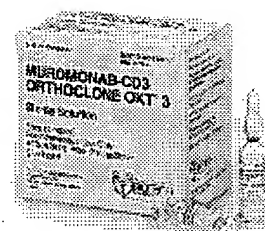
#### Biotechnology

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#### ORTHOCLONE OKT<sup>®</sup>3

Biotechnology research, begun in earnest in the 1970s, enabled Johnson & Johnson to introduce the first therapeutic monoclonal antibody product, ORTHOCLONE OKT3 (muromonab-CD3). This product is from Ortho Biotech Inc., and was approved by the FDA in 1986.

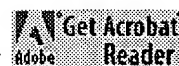
ORTHOCLONE OKT3 is marketed for the treatment of acute allograft rejection in renal transplant patients and the treatment of steroid-resistant acute allograft rejection in cardiac and hepatic transplant patients. Other monoclonal antibodies developed by our research scientists are used diagnostically.



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## Typed Drawing

**Word Mark** ORTHOCLONE OKT  
**Goods and Services** IC 005. US 018. G & S: MONOCLONAL ANTIBODIES FOR IN VIVO THERAPEUTIC USE. FIRST USE: 19860725. FIRST USE IN COMMERCE: 19860725  
**Mark Drawing Code** (1) TYPED DRAWING  
**Serial Number** 73617455  
**Filing Date** August 28, 1986  
**Published for Opposition** February 17, 1987  
**Registration Number** 1438912  
**Registration Date** May 12, 1987  
**Owner** (REGISTRANT) JOHNSON & JOHNSON CORPORATION NEW JERSEY ONE JOHNSON & JOHNSON PLAZA NEW BRUNSWICK NEW JERSEY 089337001  
**Attorney of Record** MICHAEL J. RYAN, JR.  
**Prior Registrations** 1199209;1204190  
**Type of Mark** TRADEMARK  
**Register** PRINCIPAL  
**Affidavit Text** SECT 15. SECT 8 (6-YR).  
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## Typed Drawing

**Word Mark** ORTHOCLONE  
**Goods and Services** IC 005. US 018. G & S: Monoclonal Antibody Used as Therapeutic Agent in Immune Deficient Disease States. FIRST USE: 19810611. FIRST USE IN COMMERCE: 19810611  
**Mark Drawing Code** (1) TYPED DRAWING  
**Serial Number** 73337989  
**Filing Date** November 19, 1981  
**Published for Opposition** December 14, 1982  
**Registration Number** 1229215  
**Registration Date** March 8, 1983  
**Owner** (REGISTRANT) JOHNSON & JOHNSON CORPORATION NEW JERSEY ONE JOHNSON & JOHNSON PLAZA NEW BRUNSWICK NEW JERSEY 089337001  
**Attorney of Record** RICHARD F. BIRIBAUER  
**Prior Registrations** 1199209  
**Type of Mark** TRADEMARK  
**Register** PRINCIPAL  
**Affidavit Text** SECT 15. SECT 8 (6-YR).  
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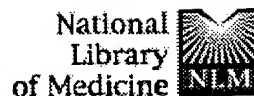
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## Typed Drawing

**Word Mark** OKT  
**Goods and Services** IC 001. US 006. G & S: In Vitro Reagents for Laboratory Use-Namely, Monoclonal Antibodies Used to Determine Patient's Immunity to Disease. FIRST USE: 19800225. FIRST USE IN COMMERCE: 19800225  
**Mark Drawing Code** (1) TYPED DRAWING  
**Serial Number** 73257550  
**Filing Date** April 10, 1980  
**Published for Opposition** May 18, 1982  
**Registration Number** 1204190  
**Registration Date** August 10, 1982  
**Owner** (REGISTRANT) Johnson & Johnson CORPORATION NEW JERSEY 501 George St. New Brunswick NEW JERSEY 08903  
**Attorney of Record** RICHARD F. BIRIBAUER  
**Type of Mark** TRADEMARK  
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**Affidavit Text** SECT 15. SECT 8 (6-YR).  
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- ☐ 1: Chadd HE, Chamow SM. [Relate](#)  
Therapeutic antibody expression technology.  
Curr Opin Biotechnol. 2001 Apr;12(2):188-94.  
PMID: 11287236 [PubMed - in process]

- ☐ 2: Little M, Kipriyanov SM, Le Gall F, Moldenhauer G. [Relate](#)  
Of mice and men: hybridoma and recombinant antibodies.  
Immunol Today. 2000 Aug;21(8):364-70. Review.  
PMID: 10916138 [PubMed - indexed for MEDLINE]

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- ☐ 3: Boel E, Verlaan S, Poppelier MJ, Westerdal NA, Van Strijp JA, Logtenberg T. [Relate](#)  
Functional human monoclonal antibodies of all isotypes constructed from phage display library-derived single-chain Fv antibody fragments.  
J Immunol Methods. 2000 May 26;239(1-2):153-66.  
PMID: 10821956 [PubMed - indexed for MEDLINE]

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